

SY-100
FUEL FLOW SENSOR

USER'S MANUAL

Description, Operation, Installation
And
Maintenance Instructions

HP-214
March 1998



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FORWARD

The manual contains the information required to install, operate, maintain, and repair a SY-100 Fuel Flow Sensor.

The SY-100 Fuel Flow Sensor is intended to be used with the SY-100 Naval Fuel Flowmeter System which is used to provide ships personnel with the ability to monitor fuel oil consumption at selected points on the vessel.

The SY-100 Fuel Flow Sensor is of a fail-safe construction where a failure of the flow sensor will not result in a blockage of fuel flow nor will a portion of the Flow Sensor come adrift.

This manual is organized to permit ease of use. Individual sections are provided to cover General Information, Operation, Functional Description, Preventative Maintenance, Troubleshooting, Installation, and Corrective Maintenance. A parts list section is also provided. Illustrations are used to improve the clarity of the information presented.

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SAFETY SUMMARY

The SY-100 Fuel Flow Sensor is designed to satisfy the safety requirements for shipboard use.

The safety precautions and warnings described here are to be observed at all times. Additional precautionary messages appear throughout this manual.

There is a danger associated with fuel oil spillage which may accompany the removal of the flow sensor from the fuel line for maintenance or repair. Drain fuel lines completely prior to removing the flow sensor.

There is danger associated with fuel oil leakage which may accompany the improper installation of the gaskets and/or improper tightening of the flange mounting bolts. Verify the quality and alignment of the flange gaskets prior to installation. Securely tighten the flange bolts during installation of the flow sensor.

The fuel flow sensor should be installed downstream of a flow strainer. Large particles passing through the flow sensor may result in a change in calibration or damage to the flow sensor.

1. GENERAL INFORMATION

1-1 Introduction

The SY-100 Fuel Flow Sensor is part of a general purpose fuel oil flow metering system for use on shipboard installations. The system provides a number of display indications of fuel usage and has an auxiliary output for optional connection to remote data acquisition system.

This technical manual provides descriptive data, operation, maintenance, installation instructions and repair parts lists for the SY-100 Fuel Flow Sensor.

1-2 Equipment Description

The SY-100 Fuel Flow Sensor is a rugged turbine flowmeter that when used with an appropriate electronics unit provides a rugged fuel flow measurement system.

The intended use of this flow sensor is to aid in providing accurate fuel measurements associated with the operations of shipboard power and propulsion plant boilers.

The SY-100 Fuel Flow Sensor is capable of accurately sensing the flow of MIL-F-16884G Marine Diesel Fuel and similar low viscosity fuels.

The flow sensor has a fail-safe construction and minimal pressure drop in the event of fouling. This adds to the ease of installation for shipboard service. A meter fuel bypass line is not required.

1-3 Reference Data

APPENDIX A details the flow measurement range capabilities and lists the reference data for the SY-100 Fuel Flow Sensors.

2. FUNCTIONAL DESCRIPTION

2-1 Introduction

The SY-100 Fuel Flow Sensor is an appropriately sized specially constructed turbine flowmeter which when used with an appropriate electronics unit is intended to provide ships company with fuel flow and consumption information.

2-2 Principle of Operation

The turbine flow sensor consists of a vaned rotor assembly which is supported on a shaft held in place by rotor supports within the flowmeter housing.

The rotor is free to spin on a carbide sleeve bearing. A magnetic pickup coil is positioned on the exterior of the flowmeter housing above the rotor. These components are shown in the following figure.

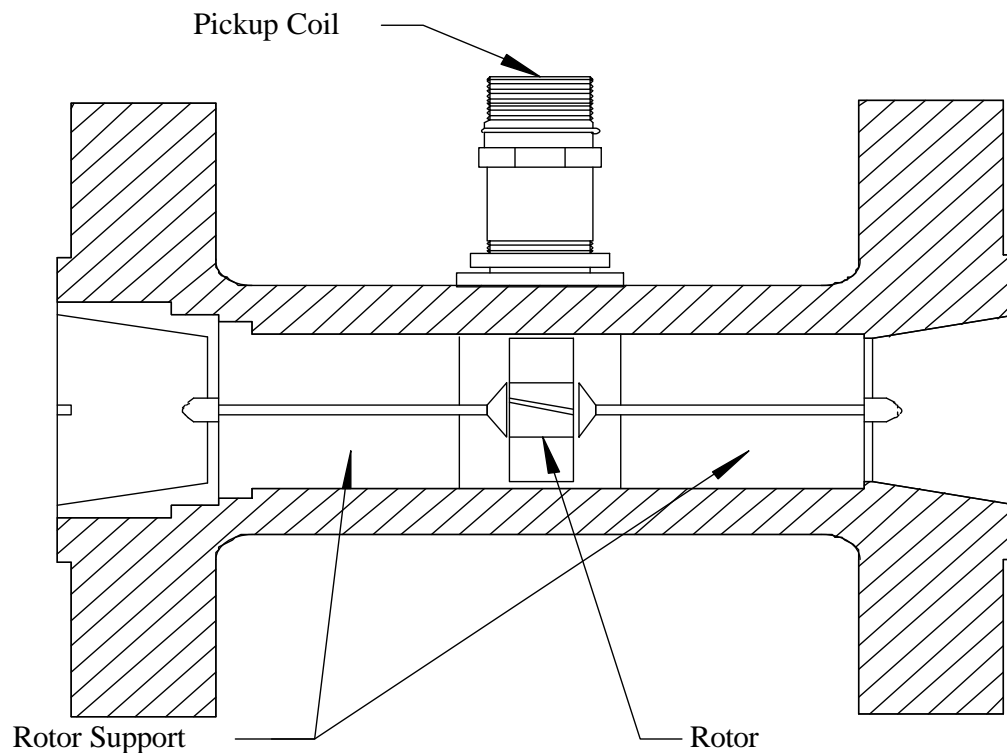


Figure 1 Flow Sensor Cut-away

As the fuel oil passes through the flowmeter it causes the vaned rotor assembly to spin at a rate proportional to the fuel oil flow rate.

The pickup coil generates a pulsing signal as the rotor spins. The frequency of this signal is proportional to flow rate while summation of this signal is proportional to flow total.

The number of pulses produced per gallon by the flow sensor is termed the calibration factor or K-Factor. This calibration factor is marked on the equipment label for each flow sensor and is unique to that particular flow sensor.

3. INSTALLATION

3-1 Introduction

This chapter provides instructions for installing the SY-100 Fuel Flow Sensor. The SY-100 Fuel Flow Sensor is composed of the following parts:

- Appropriately sized SY-100 Flow Sensor
- Mating Connector
- User Supplied Signal Cabling

Planning for the installation, site selection, unpacking, special tools, installation and installation checkout are described.

3-2 Installation Drawings

Refer to APPENDIX A for the outline drawing of the SY-100 Flow Sensors.

Refer to Figure 2 for the installation piping requirements.

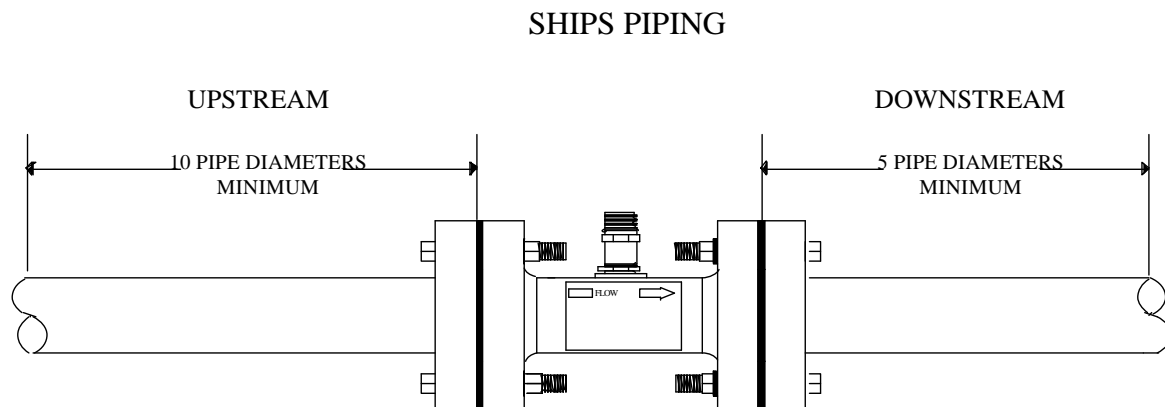


Figure 2 Flow Sensor Installation Piping Requirements

3-3 Flow Sensor Site Selection

The following provides a summary of the site selection criteria for successful installation and operation of the SY-100 Fuel Flow Sensor.

Note

A fuel flow strainer is required to be installed in the fuel system upstream of the flowmeter. The SY-100 Fuel Flow Sensor relies on the strainer to capture large foreign matter which could otherwise foul the turbine rotor.

The flow sensor shall be installed in the fuel flow line. A horizontal orientation is suggested but not required.

The site chosen for installation of the flow sensor shall maintain adequate access for maintenance and shall include provisions for safe drainage of fuel oil which is required during maintenance operations.

In addition, the location shall be chosen to maximize the distance from any nearby sources of electrical interference. Such sources include motors, transformers, fans, pumps, electric valves, ignition controls, and power wiring. The flow sensor shall be at least two feet away from any such source of interference.

The flow line upstream of the flowmeter shall be modified to provide a minimum of 10 pipe diameters of pipe of the meter size. The mating connection on the piping shall consist of an appropriately sized flange of the required pipe size to MIL-STD-777.

The flow line downstream of the flowmeter shall be modified to provide at least 5 pipe diameters of pipe of the meter size. The mating connection on the piping shall consist of an appropriately sized flange of the required pipe size to MIL-STD-777.

A user supplied interconnecting cable is required to run from the flow sensor to the electronics unit. The cable run shall provide for adequate support and mechanical protection to strain relieve the cable.

3-4 Unpacking and Packing

Caution

When unpacking or packing the flow sensor assembly, care must be taken to see that no foreign matter is permitted to enter the flowmeter housing.

If packing is required, protect the flanges with protective material. Cardboard will suffice for this purpose. Place protective covers over electrical connectors and pack into a strong carton with shock absorbing material 2 inches deep on all surfaces.

Remove the flow sensor from the carton. Remove the end covers from the flanges.

Remove the protective cover from the pickup coil connector only after the sensor is mounted in its final location.

A mating electrical connector has been supplied with each sensor, as well as, calibration records. Locate these records in the shipping container and keep them with the equipment for reference until the installation has been completed.

3-5 Flow Sensor Installation

Caution

Do not allow fuel spills when installing the flow sensor. Drain the fuel line prior to starting any work. Observe all safe practices during performance of the installation.

Do not use the flow sensor body as a "Spool Piece" during welding operations during installation of the SY-100 Fuel Flow Sensor.

Suitable fasteners for the flange ratings shall be obtained from ship's stores in advance of starting the work. Suitable gaskets (two required) are required to match the bolt pattern and meter inlet bore.

Prepare the ship's piping for the installation of the flow sensor as shown in Figure 2. Provide adequate support for this new piping to restrict travel during high shock conditions. Maintain adequate access for maintenance.

The mating flange and piping segments shall be free of weld protrusions into the piping. Such obstructions may create turbulence and result in flow measurement errors.

The ships fuel piping shall be free of all loose foreign material and welding slag.

Orient the flow sensor into the piping observing that the flow direction markings on the flow sensor body matches the direction of fuel flow in the installation.

Position gaskets and align the flange bolts in such a position that the pickup coil shall be oriented to permit ease of assembly of the interconnecting cabling and is clear of obstructions.

Place nuts on all flange bolts and tighten securely. Place the prepared interconnecting cable on the pickup coil and tighten.

3-6 Installation Checkout

Caution

Fuel leaks may occur if improper gaskets are used or flange bolts are not secure. Check bolt tightness prior to pressurizing the fuel line. Check the workmanship on all modifications to the ship's piping prior to pressurizing the fuel line.

Note

It is recommended that the fuel lines be cleaned of any debris prior to installing the flowmeter. Large pieces of debris may result in a "Stalled Turbine Rotor", which may cause damage to the "Turbine Rotor" resulting in loss of calibration for the flow sensor.

Verify that the flowmeter has been installed with the flowmeter housing orientation and flow arrow marking in the direction of fuel flow.

4. PREVENTATIVE MAINTENANCE

4-1 Introduction

This section provides a description of the cleaning and inspection procedure applicable to the SY-100 Fuel Flow Sensors.

The SY-100 Fuel Flow Sensor does not require regularly scheduled preventative maintenance.

Observe any scheduled organizational level maintenance instructions dictated by the requirements of the Planned Maintenance System (PMS) established by the Naval Sea System Command for fuel system components.

Caution

Do not allow fuel spills when servicing the flow sensor. Isolate and drain the fuel line prior to starting work. Observe all safety practices during performance of the cleaning and maintenance operations.

4-2 Flow Sensor Cleaning

Fibrous debris in the fuel system which is passed by the fuel strainer over a period of time may accumulate in the fuel flow sensor.

Such an accumulation of matter may result in a deterioration in performance or a stalled rotor condition if not cleaned periodically.

Note

The recommended spanner wrench or equal is required to disassemble and remove the internals kit from the flow sensor housing.

The recommended cleaning procedure applicable to the fuel sensor is presented in the following steps. This operation requires interruption of the service line and should be scheduled in advance.

Note

The calibration of the SY-100 Fuel Flow Sensor will be impaired if any of the rotor blades are lost or bent. Observe special handling to avoid damage to this assembly during cleaning operations.

1. Isolate and drain the fuel system prior to removal of the internals kit.
2. Disconnect the signal cable from the flow sensor pickup coil.
3. Remove the eight flange mounting bolts and remove the flow sensor from the line.
4. Study Figure 3 prior to disassembling the flow sensor. Use the appropriately sized spanner wrench to remove the retaining nut on the flowmeter inlet. The internals kit may now be removed from the flowmeter housing.

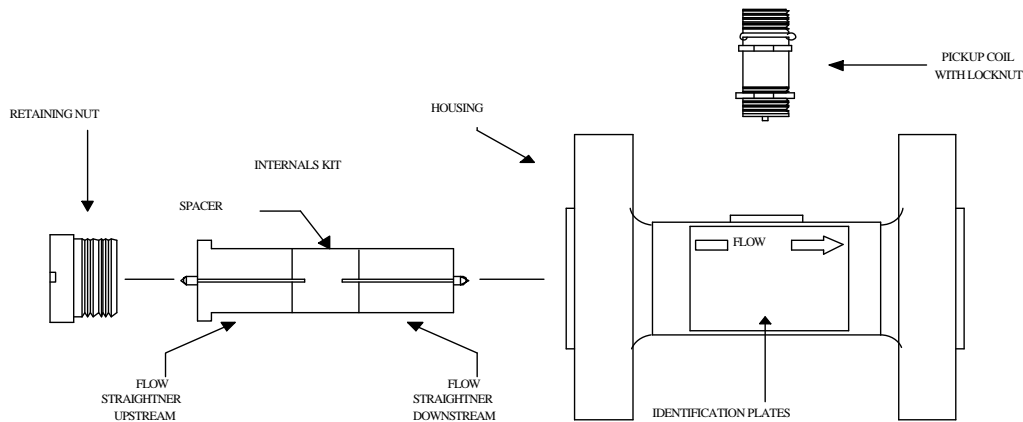


Figure 3 Flow Sensor Disassembly

5. The upstream flow straightener and spacer are a slip fit on the shaft and may now be removed from the internals kit.
6. Remove any fibrous matter which may be attaching itself on the rotor blades or wrapped about the shaft on either side of the rotor.
7. The internals kit may be cleaned in a turbine oil, solvent, PT-37 alcohol or other approved cleaning solvent to remove any sticky residue.

4-3 Flow Sensor Inspection

The following is a summary procedure for inspection of the flow sensor internals kit. The procedure is intended to assist in the assessment of the state of wear of the internals kit.

The accumulative effects of mechanical wear and chemical attack may result in a deterioration of the flow sensor bearing surfaces over a period of years.

This bearing deterioration may manifest itself in a flow measurement inaccuracy or in a stalled rotor condition.

Examine the flowmeter kit after performing the preceding cleaning procedure. Perform the following examination steps to determine if the internals kit is operating satisfactory or should be replaced at this time.

1. Lubricate the flowmeter kit with clean turbine oil.
2. The rotor should freely spin on the shaft for several seconds when spun.
3. Examine the internals kit for signs of excessive bearing wear using the criteria shown in the following figure.

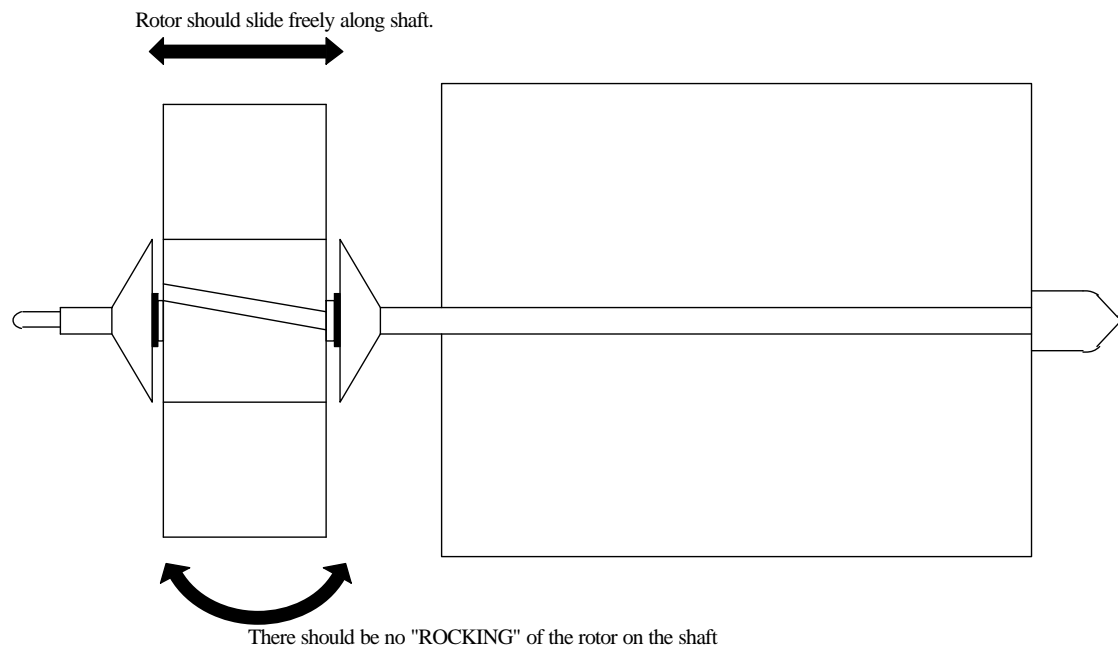


Figure 4 Inspection of Internals Kit

If replacement is suggested follow the procedure outlined in the Corrective Maintenance section of this document.

4-4 Lubrication

There are no lubrication requirements applicable to SY-100 Fuel Flow Sensors.

4-5 Flow Sensor Assembly

Slip the spacer onto the downstream flow straightener. Align the upstream flow straightener with the notches on the spacer and slip onto shaft.

Insert the assembled internal kit (see Figure 3) into the flowmeter housing. Apply thread locking adhesive #242 (blue) to the retaining nut and thread the retaining nut into the housing.

5. TROUBLESHOOTING

5-1 Introduction

The troubleshooting techniques in this chapter are designed to isolate and locate the area of failure and to present the procedures for the replacement of subassemblies to make the system operational.

5-2 Flow Sensor Troubleshooting Procedures

The required test equipment for troubleshooting the flow sensor is as follows:

- Digital Multimeter: Fluke Model 8060A or equal.
- 1. In the event of signal failure (no flow indication) the following procedure should be followed. In each case proceed to the next instruction only if the defect is not found. Refer to the fault-logic diagram (Figure 5) for the flow sensor.
- 2. Visually examine the interconnecting signal cable for broken or shorted leads.
- 3. Disconnect the signal cable from the electronics unit and from the flow sensor. Check the continuity of each lead of the cable. If defective replace or repair.
- 4. With the signal cable disconnected from the flow sensor measure the DC resistance of the pickup coil. The resistance should read between 1150 and 1550 ohms between pin A and pin B. A short or an open indicates a defective pickup coil and the pickup coil must be replaced.
- 5. With an established flow rate, configure the digital multimeter to measure AC volts, using the two volt scale. Connect the positive lead to pin A of pickup coil. And the negative lead to pin B of pickup coil. Depending on the flow rate an approximate voltage reading of 10 millivolts to 1 volt should be measured. If zero volts are measured, a stalled rotor condition is indicated. Remove the flow sensor from the piping as discussed in the previous chapter.

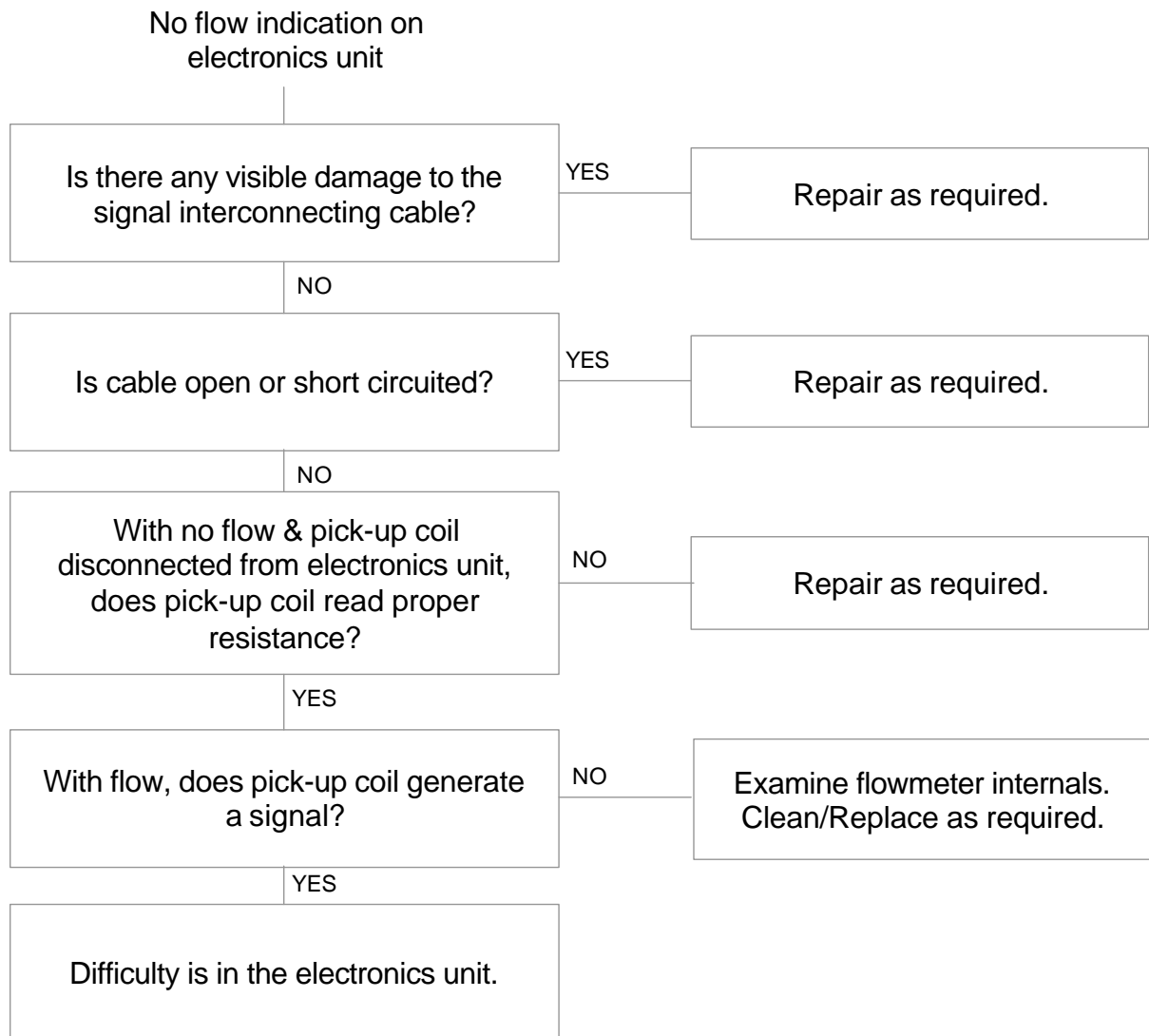


Figure 5 Flow Sensor Fault Logic Diagram

6. CORRECTIVE MAINTENANCE

6-1 Introduction

The corrective maintenance procedures are intended to provide the user with the necessary procedures to adjust, repair, and reinstall the SY-100 Fuel Flow Sensor.

The required tools and test equipment necessary to perform corrective maintenance are as follows:

- Digital Multimeter: Fluke model 8060A or equal.
- Spanner Wrench.

The information will be presented by listing the observed condition followed by the required action to be taken.

6-2 Flow Sensor Removal

Note

The recommended spanner wrench or equal is required to disassemble and remove the internals kit from the flow sensor housing.

1. Isolate and drain the fuel system prior to removal of internals kit.
2. Disconnect the signal cable from the flow sensor pickup.
3. Remove the flange mounting bolts.
4. Remove the flow sensor from the line.

6-3 Flow Sensor Cleaning

The recommended cleaning procedure applicable to the fuel sensor is presented in the following steps. Note that this operation requires interruption of the fuel service line and as such should be scheduled in advance.

Note

The calibration of the SY-100 Fuel Flow Sensor will be impaired if any of the rotor blades are lost or bent. Observe special handling to avoid damage to this assembly during cleaning operations.

1. Study Figure 6 prior to disassembling the flow sensor. Use the spanner wrench to remove the retaining nut on the flowmeter inlet. The internals kit may now be removed from the flowmeter housing.

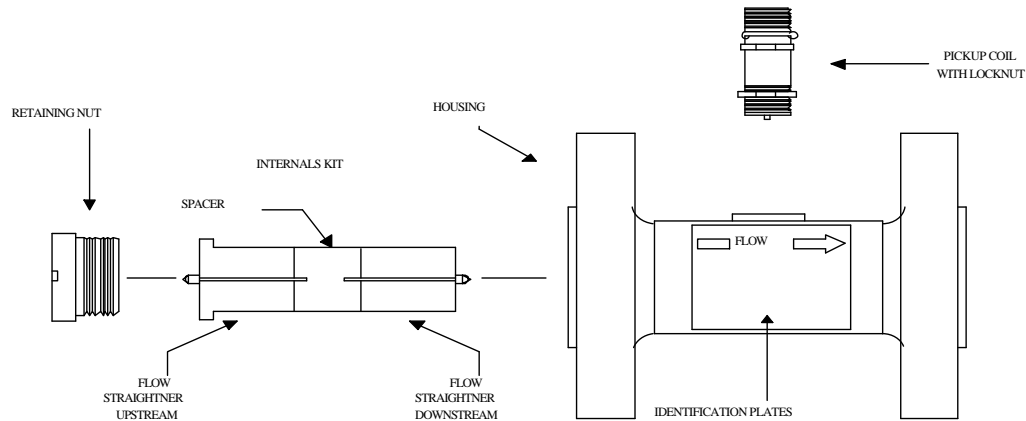


Figure 6 Flow Sensor Disassembly

2. The upstream flow straightener and spacer are a slip fit on the shaft and may now be removed from the internals kit.
3. Remove any fibrous matter which may be attaching itself on the rotor blades or wrapped about the shaft on either side of the rotor.
4. The internals kit may be cleaned in a turbine oil, solvent, alcohol or other approved cleaning solvent to remove sticky residue.
5. Reinstall the spacer and flow straightener on the shaft and insert the internals into the flowmeter housing.
6. Apply thread-locking Adhesive #242 (blue) to the retaining nut and threads into housing.

6-4 Flow Sensor Reinstallation

Caution

Do not allow fuel spills when installing the flow sensor. Drain the fuel line prior to starting any work. Observe all safety practices during performance of the installation. Do not use the flow sensor body as a "Spool Piece" during any welding operations while installing.

Suitable fasteners for the flange ratings shall be obtained from ship's stores in advance of starting the work. Suitable gaskets (two required) shall be prepared to match the bolt pattern and meter inlet bore.

The mating flange and piping segments shall be free of weld protrusions into the piping. Such obstructions may create turbulence and result in flow measurement errors.

The ship's fuel piping shall be cleaned of all loose foreign material and welding slag. Position the flow sensor into the ship's piping observing that the flow direction marking on the flow sensor body matches the direction of fuel flow in the installation.

Position gaskets and align the flange bolts in such a position that the pickup coil shall be positioned to permit ease of assembly of the interconnecting cabling and is clear of obstructions.

Place nuts on all flange bolts and tighten securely. Place the prepared interconnecting cables on the pickup and tighten.

7. PARTS LIST

7-1 Introduction

This section provides a summary of the parts lists for the SY-100 Fuel Flow Sensor .

Provisioned parts recommended for the system are also presented. Parts location illustrations are shown on the assembly drawings.

7-2 List of Attaching Hardware

The following table lists the required attaching hardware for the installation of the flow sensor. The required mating electrical connector is supplied with each sensor.

Manufacturer and Part Number	Description	Quantity
	Flange Mounting Bolts	8
	Flange Mounting Washers	16
	Flange Mounting Nuts	8
Alpha, PN 3241	Signal Cable NSN 6145-00-056-8184	TBD
MS3106F-10SL-4S Cannon	Flow Pickup Coil Mating Connector	1

Notes:

1. Mating connector is supplied with each sensor.
2. Cable types were chosen to achieve the desired electromagnetic attenuation. Armored cable types offering improved physical protection with the required braided shield may be substituted.
3. Alternate sources for MIL-C-5015 connectors may be used.

7-3 Recommend Spare Parts

The following table lists the recommended spare parts.

Meter	Internals Kit *	Pickup Coil (w/ lock nut)
HO1 1/2-SY100	HO1 1/2-3-120-T-INTERNALS-SY100	PC24-45G-SY100
HO1-SY100	HO1-4-60-T-INTERNALS-SY100	PC13-75G-SY100
HO3/4-SY100	HO3/4-2.5-29-T-INTERNALS-SY100	PC24-45G-SY100
HO1/2-SY100	HO1/2-1-10-T-INTERNALS-SY100	PC24-45G-SY100
HO3/8-SY100	HO3/8-.75-6-T-INTERNALS-SY100	PC24-45G-SY100
HO1/4-SY100	HO1/4-.35-3.5-T-INTERNALS-SY100	PC24-45G-SY100

If specific meter not found in the above list, check the specification drawings in APPENDIX A for the meter in question.

7-4 List of Manufacturers

The following table lists the manufacturers of subassembly/components utilized in the sensor and their identifying CAGE code numbers.

CAGE Code	Name and Address
33321	Hoffer Flow Controls, Inc. 107 Kitty Hawk Lane P. O. Box 2145 Elizabeth City, NC 27909
92194	Alpha Wire Corp. 711 Lidgerwood Avenue Elizabeth, NJ 07207
	ITT Cannon 666 East Dyer Road Santa Ana, CA 92702

* Internals Kit consists of rotor, cones, shaft, hangers, sleeve, and complete calibration w/ 'K' tag.

7-5 Parts Location Illustration

Refer to Figure 7 for the parts locations for the SY-100 Flow Sensor.

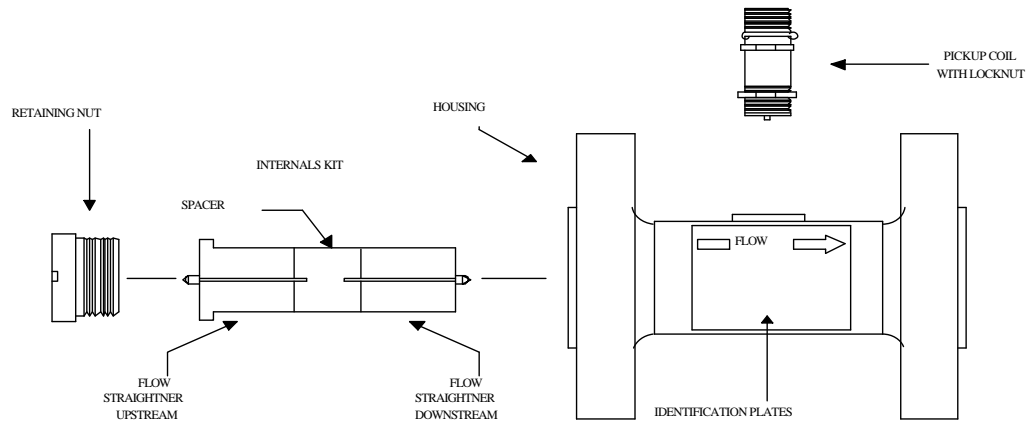


Figure 7 Flow Sensor Exploded View

APPENDIX A

SY100 Flow Sensor Specification Summary

	HO-1½-SY100 Flow Sensor
Flow Sensor Model No.	HO-1½-SY100
Fuel System Interface	300#, 1½", ANSI Raised Face Flange
Installation Length	6" ±1/16" (face to face)
Construction	Monolithic, Fail-safe Construction
Service Fuel Oil Type	MIL-E-16884G
Max. Operating Pressure (Test Pressure)	750 PSIG
Rate Flow Range	450 to 3600 Gallons per Hour
Extended Usable Range	180 to 7200 Gallons per Hour
Rate Accuracy	±2% of Reading (450 to 3600 GPH)
Repeatability	±0.5% of Reading (180 to 3600 GPH)
Stalled Rotor Pressure Drop	Less than 25 PSID
Pickup Type	Hermetically Sealed, Magnetic Motion Sensor
Output Signal Characteristics	Minimum signal 10 mVrms, sinusoidal waveform, DC impedance 1350 ohms ±10%
Mating Connector	MS-3106F-10SL-4S
Environmental	Shock Rating MIL-STD-901C Type B, Class I, Group A (Flow Sensor), Vibration MIL-STD-167-1 Type I
Spanner Wrench	P/N HO-1½-112-SY-100

HO-1-SY100 Flow Sensor

Flow Sensor Model No.	HO-1-SY100
Fuel System Interface	150#/300#, 1", ANSI Raised Face Flange
Installation Length	5.5" $\pm 1/16$ " (face to face)
Construction	Monolithic, Fail-safe Construction
Service Fuel Oil Type	MIL-E-16884G
Max. Operating Pressure (Test Pressure)	375/750 PSIG
Rate Flow Range	240 to 3600 Gallons per Hour
Extended Usable Range	120 to 4500 Gallons per Hour
Rate Accuracy	$\pm 2\%$ of Reading (240 to 3600 GPH)
Repeatability	$\pm 0.5\%$ of Reading (240 to 3600 GPH)
Stalled Rotor Pressure Drop	Less than 25 PSID
Pickup Type	Hermetically Sealed, Magnetic Motion Sensor
Output Signal Characteristics	Minimum signal 10 mVrms, sinusoidal waveform, DC impedance 1800 ohms $\pm 10\%$
Mating Connector	MS-3106F-10SL-4S
Environmental	Designed to meet Shock Rating MIL-STD-901C Type B, Class I, Group A (Flow Sensor), Vibration MIL-STD-167-1 Type I
Spanner Wrench	P/N HO-1-112-SY-100

HO-3/4-SY100 Flow Sensor

Flow Sensor Model No.	HO-3/4-SY100
Fuel System Interface	150#/300#, 3/4", ANSI Raised Face Flange
Installation Length	5.5" $\pm 1/16$ " (face to face)
Construction	Monolithic, Fail-safe Construction
Service Fuel Oil Type	MIL-E-16884G
Max. Operating Pressure (Test Pressure)	375/750 PSIG
Rate Flow Range	150 to 1740 Gallons per Hour
Extended Usable Range	90 to 2100 Gallons per Hour
Rate Accuracy	$\pm 2\%$ of Reading (150 to 1740 GPH)
Repeatability	$\pm 0.5\%$ of Reading (150 to 1740 GPH)
Stalled Rotor Pressure Drop	Less than 25 PSID
Pickup Type	Hermetically Sealed, Magnetic Motion Sensor
Output Signal Characteristics	Minimum signal 10 mVrms, sinusoidal waveform, DC impedance 1350 ohms $\pm 10\%$
Mating Connector	MS-3106F-10SL-4S
Environmental	Designed to meet Shock Rating MIL-STD-901C Type B, Class I, Group A (Flow Sensor), Vibration MIL-STD-167-1 Type I
Spanner Wrench	P/N HO-3/4-112-SY-100

HO-1/2-SY100 Flow Sensor

Flow Sensor Model No.	HO-1/2-SY100
Fuel System Interface	150#/300#, 1/2", ANSI Raised Face Flange
Installation Length	5.0" $\pm 1/16$ " (face to face)
Construction	Monolithic, Fail-safe Construction
Service Fuel Oil Type	MIL-E-16884G
Max. Operating Pressure (Test Pressure)	375/750 PSIG
Rate Flow Range	60 to 600 Gallons per Hour
Extended Usable Range	36 to 720 Gallons per Hour
Rate Accuracy	$\pm 2\%$ of Reading (60 to 600 GPH)
Repeatability	$\pm 0.5\%$ of Reading (60 to 600 GPH)
Stalled Rotor Pressure Drop	Less than 25 PSID
Pickup Type	Hermetically Sealed, Magnetic Motion Sensor
Output Signal Characteristics	Minimum signal 10 mVrms, sinusoidal waveform, DC impedance 1350 ohms $\pm 10\%$
Mating Connector	MS-3106F-10SL-4S
Environmental	Designed to meet Shock Rating MIL-STD-901C Type B, Class I, Group A (Flow Sensor), Vibration MIL-STD-167-1 Type I
Spanner Wrench	P/N HO-1/2-112-SY-100

HO-3/8-SY100 Flow Sensor

Flow Sensor Model No.	HO-3/8-SY100
Fuel System Interface	150#/300#, 1/2", ANSI Raised Face Flange
Installation Length	5.0" $\pm 1/16$ " (face to face)
Construction	Monolithic, Fail-safe Construction
Service Fuel Oil Type	MIL-E-16884G
Max. Operating Pressure (Test Pressure)	375/750 PSIG
Rate Flow Range	45 to 360 Gallons per Hour
Extended Usable Range	18 to 540 Gallons per Hour
Rate Accuracy	$\pm 2\%$ of Reading (45 to 360 GPH)
Repeatability	$\pm 0.5\%$ of Reading (45 to 360 GPH)
Stalled Rotor Pressure Drop	Less than 25 PSID
Pickup Type	Hermetically Sealed, Magnetic Motion Sensor
Output Signal Characteristics	Minimum signal 10 mVrms, sinusoidal waveform, DC impedance 1350 ohms $\pm 10\%$
Mating Connector	MS-3106F-10SL-4S
Environmental	Designed to meet Shock Rating MIL-STD-901C Type B, Class I, Group A (Flow Sensor), Vibration MIL-STD-167-1 Type I
Spanner Wrench	P/N HO-3/8-112-SY-100

HO-1/4-SY100 Flow Sensor

Flow Sensor Model No.	HO-1/4-SY100
Fuel System Interface	150#/300#, 1/2", ANSI Raised Face Flange
Installation Length	5.0" $\pm 1/16$ " (face to face)
Construction	Monolithic, Fail-safe Construction
Service Fuel Oil Type	MIL-E-16884G
Max. Operating Pressure (Test Pressure)	375/750 PSIG
Rate Flow Range	21 to 210 Gallons per Hour
Extended Usable Range	15 to 270 Gallons per Hour
Rate Accuracy	$\pm 2\%$ of Reading (21 to 210 GPH)
Repeatability	$\pm 0.5\%$ of Reading (21 to 210 GPH)
Stalled Rotor Pressure Drop	Less than 25 PSID
Pickup Type	Hermetically Sealed, Magnetic Motion Sensor
Output Signal Characteristics	Minimum signal 10 mVrms, sinusoidal waveform, DC impedance 1350 ohms $\pm 10\%$
Mating Connector	MS-3106F-10SL-4S
Environmental	Designed to meet Shock Rating MIL-STD-901C Type B, Class I, Group A (Flow Sensor), Vibration MIL-STD-167-1 Type I
Spanner Wrench	P/N HO-1/4-112-SY-100

SY100 Flow Sensor Outline Drawings w/ Specifications

List of Control Drawings

Drawing Number	Description
SY100-402	HO1 1/2X1 1/2-3-120-T-1M-F3SS-SY100 FLOWMETER
HO1-2204	1" X 1" SY100 FLOWMETER
HO3/4-2204	3/4" X 3/4" SY100 FLOWMETER
HO1/2-2204	1/2" X 1/2" SY100 FLOWMETER
HO3/8-2204	1/2" X 3/8" SY100 FLOWMETER
HO1/4-2204	1/2" X 1/4" SY100 FLOWMETER

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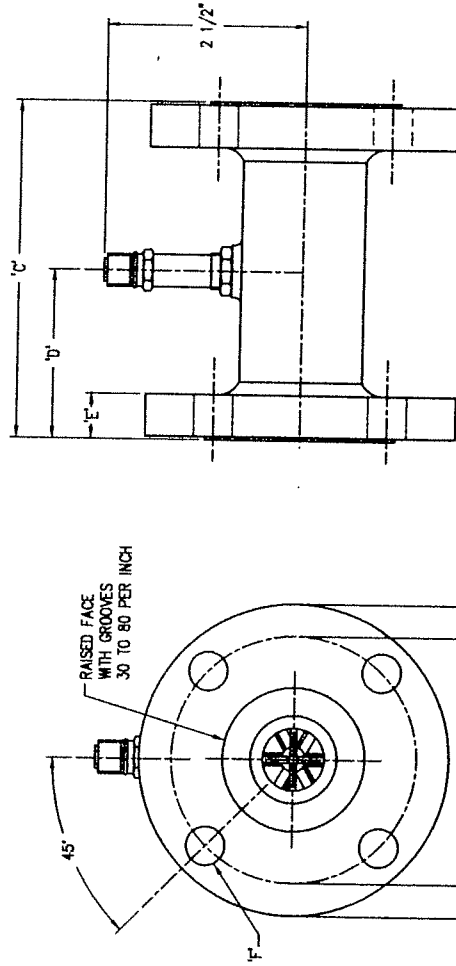
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SPECIFICATIONS:

1. GENERAL:
 - FLUID MEDIA: F-76 FUEL (MIL-F-1688AG @ 20°C)
 - FLOW RATE RANGE: MINIMUM 21 GPH (3.5GPM)
 - MAXIMUM 210 GPH (3.5GPM)
 - OVERANGE: 270 GPH
 - LINEARITY: ±0.0% OF READING 21 TO 210 GPH
 - REPEATABILITY: ±0.5% OF READING
 - PRESSURE DROP: (LOCKED ROTOR) LESS THAN 25 PSID @ 210 GPH
 - OPERATING TEMPERATURE: 40°F TO 140°F, 80% R.H.
 - PROOF PRESSURE: 375 PSIG FOR 150# FLANGES
 - 750 PSIG FOR 300# FLANGES
2. MILITARY SPECIFICATIONS:
 - BUILT TO MEET SAME STYLE NAVY CONSTRUCTION AS SY100-400
 - VIBRATION: MIL-STD-167-1, TYPE I AND II
 - SHOCK: MIL-STD-883C-H, TYPE B, CLASS I, GRADE A
 - RELIABILITY: 810 LIFE OF 3 YEARS
 - FLANGES: MIL-STD-777
 - WELDING: (NOTE 8) MIL-STD-278 AND P10 OF MIL-STD-22
 - INSPECTION: MIL-I-45208
 - IDENTIFICATION: ELECTRO ETCHED ON BODY
3. MATERIALS OF CONSTRUCTION:
 - BEARINGS: TUNGSTON CARBIDE SLEEVE, JOURNAL
 - BUSHING AND 2 WASHERS
 - ROTOR: 17.4 PH S.S.
 - FLOW STRAIGHTENERS: 316 S.S.
 - HOUSINGS: 316 S.S.
 - FLANGES: 316 S.S.
4. MOUNTING REQUIREMENTS:
 - UPSTREAM STRAIGHT PIPE RUN: 10" OF 1/2" PIPE
 - DOWSTREAM STRAIGHT PIPE RUN: 5" OF 1/2" PIPE
 - ORIENTATION LIMITS: NONE
 - NO FLOW STRAIGHTENERS REQUIRED
5. TEST REQUIREMENTS:
 - 10 POINT WATER CALIBRATION @ 1G/STKS
 - UNLESS OTHER VISCOSITY REQUESTED
 - HYDROSTATIC TESTING: 375 PSIG FOR 150#
 - 750 PSIG FOR 300#
6. MAINTAINABILITY:
 - MTTR: 2 HOURS OR LESS
 - 95% OF CORRECTIVE MAINTENANCE, 3 1/2 HOURS OR LESS
7. MATING CONNECTORS:
 - MS108F-10SL-4S PER MIL-C-5015
 - SUPPLIED WITH EACH METER.
8. FLOWMETER BODY AND FLANGES WELDED PER MIL-STD-278.
9. RECOMMENDED SPARE PARTS:
 - INTERNALS ASSEMBLY:
 - P/N H01/4-35-3.5-T-INTERNALS-SY100
 - CONSISTS OF ROTOR, CONES, SHAFT, HANGERS AND SLEEVE. COMPLETE WITH CALIBRATION AND 'K' TAG.
 - SPANNER WRENCH
 - PICKUP COIL (MAGNETIC) P/N PC24-45G-SY100



FLANGE	A'	B'	C'	D'	E'	F'
150#	3.50	2.38	5.00	2.50	.38	.62
300#	3.75	2.62	5.00	2.50	.56	.62

DRAWING NO. H01/4-2204		SH 1		REV -	
ZONE REV		DESCRIPTION		DATE	
APP					
H		HOFFER FLOW CONTROLS, INC		ELIZABETH CITY, NC 27909	
TITLE		CONTROL DRAWING,		1/2" X 1/4" SY100	
FLOWMETER		CASE CODE		H01/4-2204	
SIZE		C 33321		REV -	
SCALE		NONE		SHEET 1 OF 1	
DRAWN		CHECKED		DATE	
TOLERANCE PER MIL-STD-777		FINISH			
MATERIAL		NOTE 4			
NEXT ASSY		USED ON			
APPLICATION					

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES. DIMENSIONS OTHER THAN THE SIZE OF RAW MATERIAL SHALL BE AS FOLLOWS:

3 PLACE DECIMALS ± 1/100
2 PLACE DECIMALS ± 1/50
1 PLACE DECIMAL ± 1/25

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SPECIFICATIONS:

1. GENERAL:
FLUID MEDIA: F-76 FUEL (MIL-F-16884G @ 20°C)
FLOW RATE RANGE: MINIMUM 45 GPH (75GPM)
MAXIMUM 360 GPH (6.0CPM)
OVERDRAIN: 270 GPH
LINEARITY: ±2.0% OF READING 45 TO 360 GPH
REPEATABILITY: ±0.5% OF READING
PRESSURE DROP: (LOCKED ROTOR) LESS THAN 25 PSID @ 360 GPH
OPERATING TEMPERATURE: 40°F TO 140°F, 80% R.H.
PROOF PRESSURE: 375 PSIG FOR 150# FLANGES
750 PSIG FOR 300# FLANGES

2. MILITARY SPECIFICATIONS:
BUILT TO MEET SAME STYLE NAVY CONSTRUCTION
AS SY100-400.
VIBRATION: MIL-STD-167-1, TYPE I AND II
SHOCK: MIL-STD-883C-H, TYPE B, CLASS I, GRADE A
RELIABILITY: 810 LIFE OF 3 YEARS
FLANGES: MIL-STD-777
WELDING: (NOTE 8) MIL-STD-278 AND P10 OF MIL-STD-22
INSPECTION: MIL-I-45208
IDENTIFICATION: ELECTRO ETCHED ON BODY

3. MATERIALS OF CONSTRUCTION:
BEARINGS: TUNGSTON CARBIDE SLEEVE, JOURNAL
BUSHING AND 2 WASHERS
ROTOR: 17.4 PH S.S.
FLOW STRAIGHTENERS: 316 S.S.
HOUSING: 316 S.S.
FLANGES: 316 S.S.

4. MOUNTING REQUIREMENTS:
UPSTREAM STRAIGHT PIPE RUN: 10" OF 1/2" PIPE
DOWNSTREAM STRAIGHT PIPE RUN: 5" OF 1/2" PIPE
ORIENTATION LIMITS: NONE
NO FLOW STRAIGHTENERS REQUIRED

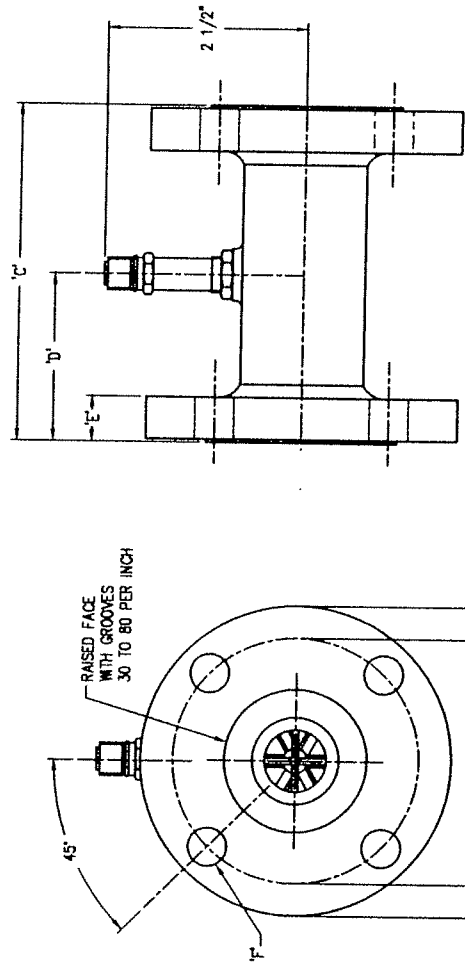
5. TEST REQUIREMENTS:
10 POINT WATER CALIBRATION @ 10STKS
UNLESS OTHER VISCOSITY REQUESTED
HYDROSTATIC TESTING: 375 PSIG FOR 150#
750 PSIG FOR 300#

6. MAINTAINABILITY:
MTTR: 2 HOURS OR LESS
85% OF CORRECTIVE MAINTENANCE 3 1/2 HOURS OR LESS

7. MATING CONNECTORS:
MS108F-10SL-4S PER MIL-C-5015
SUPPLIED WITH EACH METER.

8. FLOWMETER BODY AND FLANGES WELDED
PER MIL-STD-278.

9. RECOMMENDED SPARE PARTS:
INTERNAL ASSEMBLY:
P/N H03/8-75-6-T-INTERNAL-SY100
CONSISTS OF ROTOR, CONES, SHAFT, HANGERS
AND SLEEVE. COMPLETE WITH CALIBRATION AND
'X' TAG.
SPANNER WRENCH
PICKUP COIL (MAGNETIC) P/N PC24-450-SY100



FLANGE	'A'	'B'	'C'	'D'	'E'	'F'
150#	3.50	2.38	5.00	2.50	.38	.82
300#	3.75	2.62	5.00	2.50	.56	.82

DRAWN		DATE		HOFFER FLOW CONTROLS, INC	
CHECK		9/20/81		ELIZABETH CITY, NC 27909	
PROJ EN		9/20/81		TITLE	
MATERIAL		NOTE 4		CONTROL DRAWING,	
TOLERANCE PER MIL-STD-777		FINISH		1 1/2" X 3/8" SY100	
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NEXT ASSY		USED ON		SIZE	
APPLICATION		SCALE		C 33321	
		NONE		DWG NO	
				H03/8-2204	
				REV	
				1 OF 1	

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SPECIFICATIONS

- GENERAL:
FLUID MEDIA: F-76 FUEL (ML-F-168846 @ 20°C)
FLOW RATE RANGE: MINIMUM 60 GPH (1.0GPM)
MAXIMUM 600 GPH (10.0GPM)
OVERFLOW: 270 GPH
LINEARITY: ±2.0% OF READING 60 TO 600 GPH
REPEATABILITY: ±0.1% OF READING
PRESSURE DROP: (LOCKED ROTOR) LESS THAN 25 PSID @ 600 GPH
OPERATING TEMPERATURE: 40°F TO 140°F, 80% RH
PROOF PRESSURE: 375 PSIG FOR 1504 FLANGES
750 PSIG FOR 3004 FLANGES

- MILITARY SPECIFICATIONS:
BUILT TO MEET SAME STYLE NAVY CONSTRUCTION
AS SY100-400
VARIATION: ML-STD-167-1, TYPE I AND II
SHOCK: ML-STD-891-A, TYPE B, CLASS 1, GRADE A
RELIABILITY: 810 LIFE OF 3 YEARS
FLANGES: ML-STD-777
WELDING (NOTE 8) ML-STD-278 AND P10 OF ML-STD-22
INSPECTION: ML-4-65208
IDENTIFICATION: ELECTRO ETCHED ON BODY

- MATERIALS OF CONSTRUCTION:
BEARINGS: TUNGSTON CARBIDE SLEEVE, JOURNAL
BUSHING AND 2 WASHERS
ROTOR: 17-4 PH S.S.
FLOW STRAIGHTENERS: 316 S.S.
HOUSING: 316 S.S.
FLANGES: 316 S.S.

- MOUNTING REQUIREMENTS:
UPSTREAM STRAIGHT PIPE RUN: 10" OF 1/2" PIPE
DOWNSTREAM STRAIGHT PIPE RUN: 5" OF 1/2" PIPE
ORIENTATION LIMITS: NONE
NO FLOW STRAIGHTENERS REQUIRED

- TEST REQUIREMENTS:
10 POINT WATER CALIBRATION @ 15STPS
UNLESS OTHER VISCOSITY REQUESTED
HYDROSTATIC TESTING: 375 PSIG FOR 1504
750 PSIG FOR 3004

- MAINTAINABILITY:
MTTR: 2 HOURS OR LESS
80% OF CORRECTIVE MAINTENANCE, 3 1/2 HOURS OR LESS

- MATING CONNECTORS:
MS100F-102L-4S PER ML-C-5015
SUPPLIED WITH EACH METER.

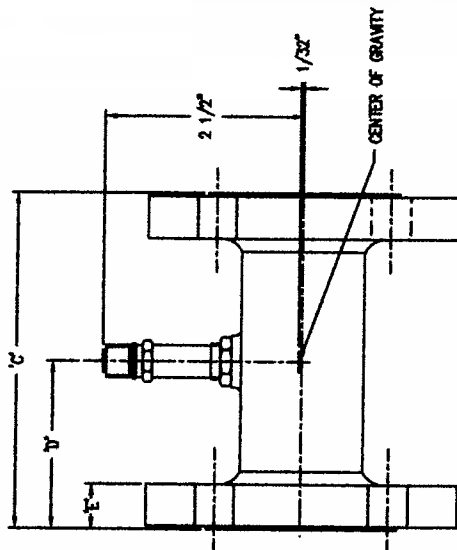
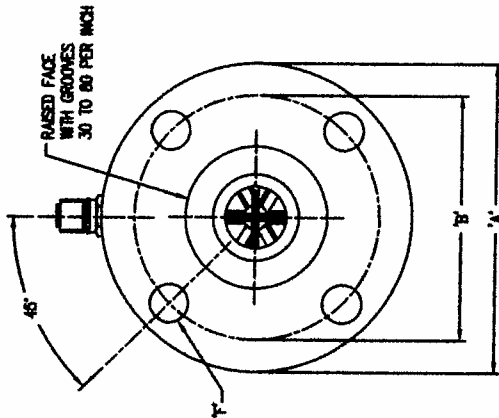
- FLOWMETER BODY AND FLANGES WELDED
PER ML-STD-278.

- RECOMMENDED SPARE PARTS:

- INTERVALS ASSEMBLY:
P/M HO1/2-1-10-T-INTERVALS-SY100
CONSISTS OF ROTOR, CONES, SHAFT, HANGERS
AND SLEEVE COMPLETE WITH CALIBRATION AND
Y-TAG
SPANNER WRENCH
PICKUP COIL (MAGNETIC) P/M PC24-450-SY100

SY100 COMPONENT PART NUMBERS

HOUSING 1504	300-0684
HOUSING 3004	300-0688
RETAINING NUT	300-8473
INTERVALS KIT	HO1/2-1-10-T-INTERVALS-SY100
PICKUP COIL	PC24-450-SY100
SPANNER WRENCH	300-8482



FLANGE	A'	B'	C'	D'	E'	F'	WEIGHT
1504	3.50	2.38	5.00	2.50	.38	.62	4.3 LBS
3004	3.75	2.62	5.00	2.50	.58	.62	5 LBS

DATE: 08/01/01 DRAWN: E. SALVO CHECK: F. SALVO PROJ. NO. 1001		SHEET: 1 OF 1	
MATERIAL: NOTE 4 TOLERANCE PER ML-STD-777		SYMBOL: 080102	
FINISH: PBRN			
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NOT ASY	USED ON	APPLICATION	
H OFFER FLOW CONTROLS, INC. ELIZABETH CITY, NC 27909		CONTROL DRAWING, 1/2" X 1/2" SY100 FLOWMETER	
REV: C	33321	REV: B	2204
NONE		H01/2-2204	

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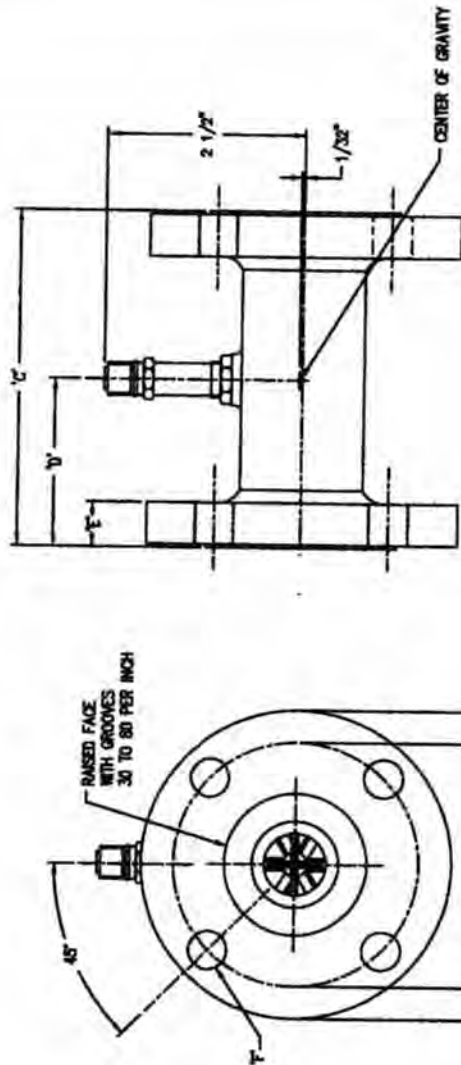
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SPECIFICATIONS:

1. GENERAL:
 - FLUID MEDIA: F-76 FUEL (ML-F-16884G @ 20°C)
 - FLOW RATE RANGE: MINIMUM 150 GPH (2.50 GPM)
 - MAXIMUM 1740 GPH (28.00 GPM)
 - OVERDRAUGHT: 2100 GPH
 - LINEARITY: ±2.0% OF READING 150 TO 1740 GPH
 - REPEATABILITY: ±0.5% OF READING
 - PRESSURE DROP: (LOOKED BOTTOM) LESS THAN 25 PSID @ 1740 GPH
 - OPERATING TEMPERATURE: 40°F TO 140°F, 80% RH.
 - PROOF PRESSURE: 375 PSIG FOR 1500 FLANGES
 - 750 PSIG FOR 300 FLANGES
2. MILITARY SPECIFICATIONS:
 - BUILT TO MEET SAME STYLE NAVY CONSTRUCTION AS SY100-400.
 - VARIATION: ML-STD-167-1, TYPE I AND II
 - SHOCK: ML-STD-801-H, TYPE B, CLASS I, GRADE A
 - RELIABILITY: 810 LIFE OF 3 YEARS
 - FLANGES: ML-STD-777
 - WELDING: (NOTE 8) ML-STD-278 AND P10 OF ML-STD-22
 - INSPECTION: ML-I-40208
 - IDENTIFICATION: ELECTRO ETCHED ON BODY
3. MATERIALS OF CONSTRUCTION:
 - BEARINGS: TRANSMISSION CARBIDE SLEEVE, JOURNAL
 - BUSHING AND 2 WASHERS
 - ROTOR: 174 PH S.S.
 - FLOW STRAIGHTENERS: 316 S.S.
 - HOUSING: 316 S.S.
 - FLANGES: 316 S.S.
4. MOUNTING REQUIREMENTS:
 - UPSTREAM STRAIGHT PIPE RUN 10" OF 3/4" PIPE
 - DOWNSIDE STRAIGHT PIPE RUN 5" OF 3/4" PIPE
 - ORIENTATION LIMITS: NONE
 - NO FLOW STRAIGHTENERS REQUIRED
5. TEST REQUIREMENTS:
 - 10 POINT WATER CALIBRATION @ 100% UNLESS OTHER VISCOSITY REQUESTED
 - HYDROSTATIC TESTING: 375 PSIG FOR 1500
 - 750 PSIG FOR 300
6. MAINTAINABILITY:
 - MTTR: 2 HOURS OR LESS
 - BOX OF CORRECTIVE MAINTENANCE, 3 1/2 HOURS OR LESS
7. MATING CONNECTORS:
 - SECTION-102L-4S PER ML-C-5015
 - SUPPLIED WITH EACH METER.
8. FLOWMETER BODY AND FLANGES WELDED PER ML-STD-278.
9. RECOMMENDED SPARE PARTS:
 - INTERIALS ASSEMBLY:
 - P/N H03/4-2-5-28-T-INTERIALS-SY100
 - CONSISTS OF ROTOR, CONES, SHAFT, HANKERS AND SLEEVE COMPLETE WITH CALIBRATION AND X-TAL.
 - PICKUP COIL (MAGNETIC) P/N PC24-450-SY100

SY100 COMPONENT PART NUMBERS	
HOUSING 1500	300-0085
HOUSING 3000	300-0580
RETAINING NUT	300-0474
INTERIALS KIT	H03/4-2-5-28-T-INTERIALS-SY100
PICKUP COIL	PC24-450-SY100
SPANNER WRENCH	300-0453



FLANGE	"A"	"B"	"C"	"D"	"E"	"F"	WEIGHT
1500	3.80	2.75	5.50	2.75	.50	.02	4.3 LBS
3000	4.62	3.25	5.50	2.75	.02	.75	5.5 LBS

H OFFER FLOW CONTROLS, INC ELIZABETH CITY, NC 27909		H HOFFER FLOW CONTROLS, INC ELIZABETH CITY, NC 27909	
CONTROL DRAWING, 3/4" X 3/4" SY100 FLOWMETER		CONTROL DRAWING, 3/4" X 3/4" SY100 FLOWMETER	
DATE	3/33/21	DATE	3/33/21
SCALE	NONE	SCALE	NONE
SHEET	1 OF 1	SHEET	1 OF 1

ZONE	REV	DESCRIPTION	DATE	APP
A	1	ADDED TABLE OF PART NUMBERS.	9/25/19	ES
B	1	ADDED WEIGHTS AND CENTER OF GRAVITY	000000	ES

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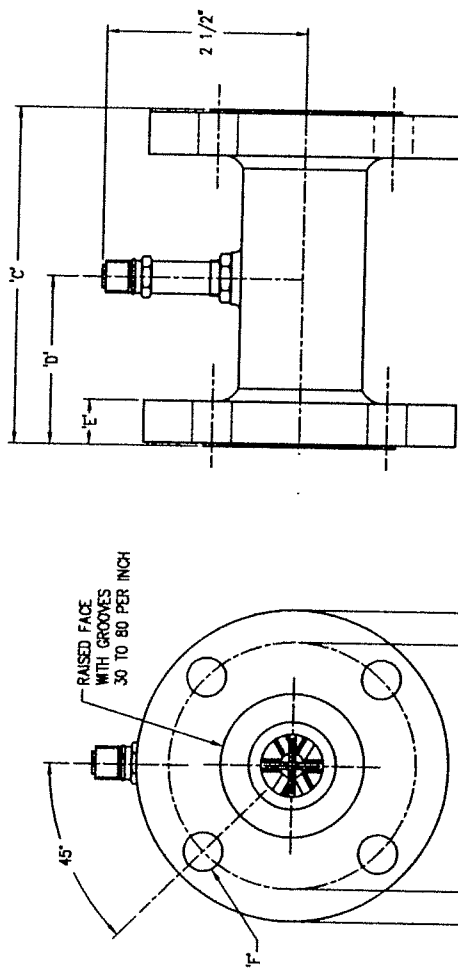
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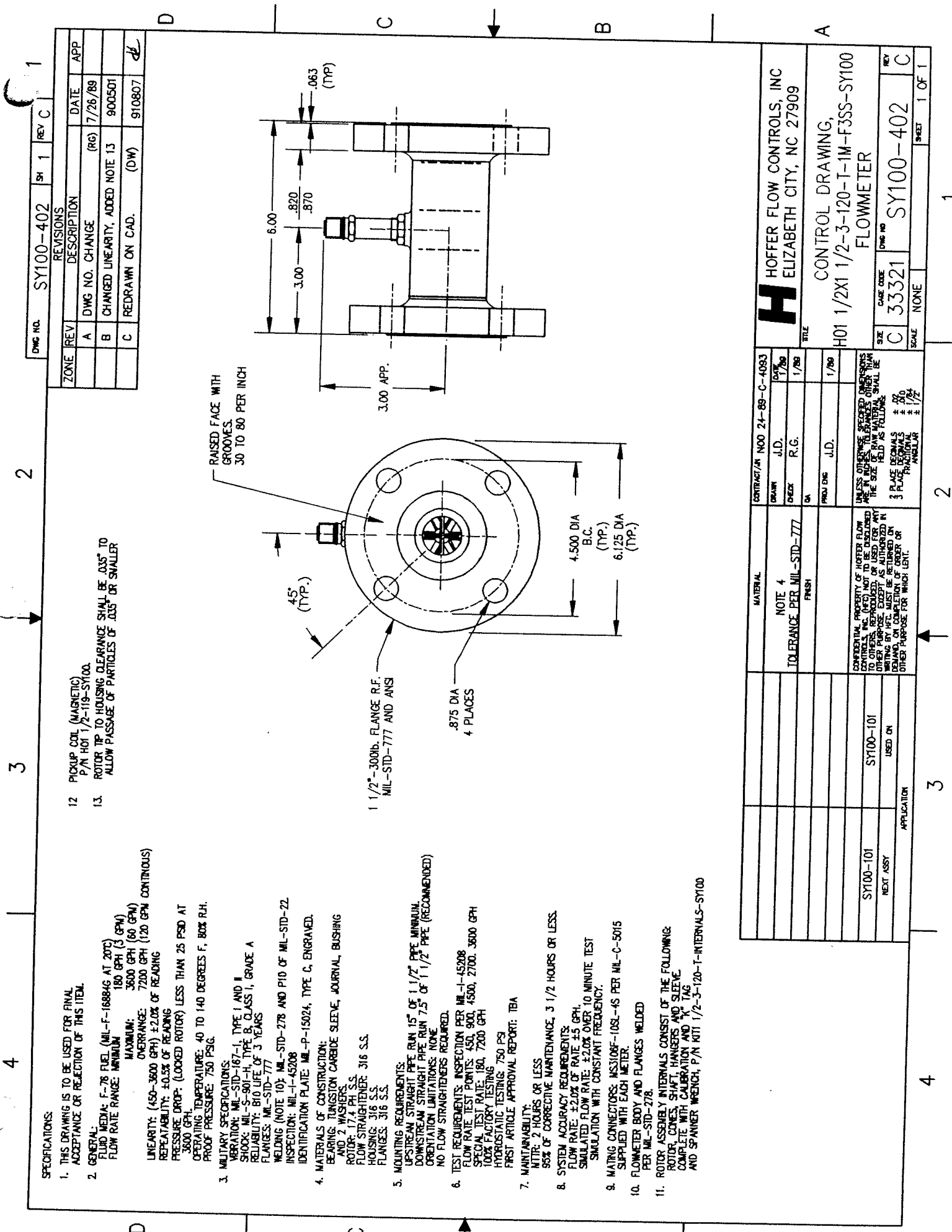
SPECIFICATIONS:

- GENERAL:
FLUID MEDIA: F-78 FUEL (MIL-F-18884G @ 20°C)
FLOW RATE RANGE: MINIMUM 240 GPH (4.0GPM)
MAXIMUM 3600 GPH (60.0GPM)
OVER RANGE: 4500 GPH
LINEARITY: ±2.0% OF READING 240 TO 3600 GPH
REPEATABILITY: ±0.5% OF READING
PRESSURE DROP: (LOCKED ROTOR) LESS THAN 25 PSID @ 3600 GPH
OPERATING TEMPERATURE: 40°F TO 140°F, 80% R.H.
PROOF PRESSURE: 375 PSIG FOR 150# FLANGES
750 PSIG FOR 300# FLANGES
- MILITARY SPECIFICATIONS:
BUILT TO MEET SAME STYLE NAVY CONSTRUCTION
AS SY100-400.
VIBRATION: MIL-STD-167-1, TYPE I AND II
SHOCK: MIL-STD-883C-H, TYPE B, CLASS I, GRADE A
RELIABILITY: 810 LIFE OF 3 YEARS
FLANGES: MIL-STD-777
WELDING: (NOTE 8) MIL-STD-278 AND P10 OF MIL-STD-22
INSPECTION: MIL-I-45208
IDENTIFICATION: ELECTRO ETCHED ON BODY
- MATERIALS OF CONSTRUCTION:
BEARINGS: TUNGSTON CARBIDE SLEEVE, JOURNAL
ROTOR: 17.4 PH. S.S.
FLOW STRAIGHTENERS: 316 S.S.
HOUSING: 316 S.S.
FLANGES: 316 S.S.
- MOUNTING REQUIREMENTS:
UPSTREAM STRAIGHT PIPE RUN: 10" OF 1" PIPE
DOWNSTREAM STRAIGHT PIPE RUN: 5" OF 1" PIPE
ORIENTATION LIMITS: NONE
NO FLOW STRAIGHTENERS REQUIRED
- TEST REQUIREMENTS:
10 POINT WATER CALIBRATION @ 10STKS
UNLESS OTHER VISCOSITY REQUESTED
HYDROSTATIC TESTING: 375 PSIG FOR 150#
750 PSIG FOR 300#
- MAINTAINABILITY:
MTTR: 2 HOURS OR LESS
95% OF CORRECTIVE MAINTENANCE, 3 1/2 HOURS OR LESS
- MATING CONNECTORS:
MS3108F-10SL-4S PER MIL-C-5015
SUPPLIED WITH EACH METER.
- FLOWMETER BODY AND FLANGES WELDED
PER MIL-STD-278.
- RECOMMENDED SPARE PARTS:
INTERVALS ASSEMBLY:
P/N HOI-4-60-T-INTERVALS-SY100
CONSISTS OF ROTOR, CONES, SHAFT, HANGERS
AND SLEEVE. COMPLETE WITH CALIBRATION AND
"K" TAG.
SPANNER WRENCH
PICKUP COIL (MAGNETIC) P/N PC13-74G-SY100



FLANGE	'A'	'B'	'C'	'D'	'E'	'F'
150#	4.25	3.12	5.50	2.75	.56	.62
300#	4.88	3.50	5.50	2.75	.89	.75

DRAWING NO. HOI-2204		SH 1		REV -	
ZONE REV		DESCRIPTION		DATE APP	
H		HOFFER FLOW CONTROLS, INC ELIZABETH CITY, NC 27909		TITLE	
CONTROL DRAWING, 1" X 1" SY100 FLOWMETER		SIZE C		CASE CODE 33321	
REV -		DWG NO HOI-2204		SHEET 1 OF 1	
SCALE NONE		NONE		1	
MATERIAL NOTE 4 TOLERANCE PER MIL-STD-777		FINISH		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES OTHER THAN THE SIZE HELD AS FOLLOWS: 3 PLACE DECIMALS ± .005 FRACTIONAL ± 1/32	
APPLICATION		NEXT ASST		USED ON	



SPECIFICATIONS:

- THIS DRAWING IS TO BE USED FOR FINAL ACCEPTANCE OR REJECTION OF THIS ITEM.
- GENERAL:
FLUID MEDIA: F-78 FUEL (MIL-F-16894G AT 200°)
FLOW RATE RANGE: MINIMUM 180 GPH (3 GPM)
MAXIMUM 3600 GPH (60 GPM)
OVERRANGE: 7200 GPH (120 GPM CONTINUOUS)
LINEARITY: (450-3600 GPH) ±2.0% OF READING
REPEATABILITY: ±0.5% OF READING
PRESSURE DROP: (LOOKED ROTOR) LESS THAN 25 PSID AT 3600 GPH
OPERATING TEMPERATURE: 40 TO 140 DEGREES F, 80% RH.
PROOF PRESSURE: 750 PSIG.
- MILITARY SPECIFICATIONS:
VARIATION: MIL-STD-167-1, TYPE I AND II
SHOCK: MIL-S-901-H, TYPE B, CLASS I, GRADE A
RELIABILITY: 810 LIFE OF 3 YEARS
FLANGES: MIL-STD-777
WELDING (NOTE 10): MIL-STD-278 AND P10 OF MIL-STD-22
INSPECTION: MIL-I-45208
IDENTIFICATION PLATE: MIL-P-15024, TYPE C, ENGRAVED.
- MATERIALS OF CONSTRUCTION:
BEARING: TUNGSTON CARBIDE SLEEVE, JOURNAL, BUSHING AND 2 WASHERS.
ROTOR: 17.4 PH S.S.
FLOW STRAIGHTENER: 316 S.S.
HOUSING: 316 S.S.
FLANGES: 316 S.S.
- MOUNTING REQUIREMENTS:
UPSTREAM STRAIGHT PIPE RUN 15" OF 1 1/2" PIPE MINIMUM.
DOWNSTREAM STRAIGHT PIPE RUN 7.5" OF 1 1/2" PIPE (RECOMMENDED)
ORIENTATION LIMITATIONS: NONE
NO FLOW STRAIGHTENERS REQUIRED.
- TEST REQUIREMENTS: INSPECTION PER MIL-I-45208
FLOW RATE TEST POINTS: 450, 900, 1800, 2700, 3600 GPH
SPECIAL TEST RATE: 180, 7200 GPH
100% FACTORY TESTING
HYDROSTATIC TESTING: 750 PS
FIRST ARTICLE APPROVAL REPORT: TBA
- MAINTAINABILITY:
MTR: 2 HOURS OR LESS
95% OF CORRECTIVE MAINTENANCE, 3 1/2 HOURS OR LESS.
- SYSTEM ACCURACY REQUIREMENTS:
FLOW RATE: ±2.0% OF RATE ±5 GPM.
SIMULATED FLOW RATE: ±2.0% OVER 10 MINUTE TEST
SIMULATION WITH CONSTANT FREQUENCY.
- MATING CONNECTORS: MS3106-10SL-4S PER MIL-C-5015
SUPPLIED WITH EACH METER.
- FLOWMETER BODY AND FLANGES WELDED PER MIL-STD-278.
- ROTOR ASSEMBLY INTERVALS CONSIST OF THE FOLLOWING:
ROTOR CONES, SHAFT, HANGERS AND SLEEVE
COMPLETE WITH CALIBRATION AND X-TAG
AND SPANNER WRENCH, P/N KIT 1/2-3-120-T-INTERVALS-SY100

- PICKUP COIL (MAGNETIC)
P/N KIT 1/2-119-SY100.
- ROTOR TIP TO HOUSING CLEARANCE SHALL BE .035" TO ALLOW PASSAGE OF PARTICLES OF .035" OR SMALLER

SY100-402			
DWG NO.	REV	DATE	APP
SY100-402	A	7/26/89	
	B	900501	
	C	910807	

H OFFER FLOW CONTROLS, INC ELIZABETH CITY, NC 27909			
CONTROL DRAWING, H01 1/2X1 1/2-3-120-T-IM-F3SS-SY100 FLOWMETER			
SIZE	C 33321	DWG NO	SY100-402
SCALE	NONE	REV	C
SHEET 1 OF 1			

MATERIAL	NOTE 4	CONTRACTOR NOO 24-89-C-4083
TOLERANCE PER MIL-STD-777	FINISH	DRAWN J.D. 1/78
		CHECK R.G. 1/78
		QA
		PROD ENG J.D. 1/78

SY100-101	USED ON	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES OTHER THAN THE SIZE HELD AS FOLLOWS SHALL BE:
NEXT ASSY		3 PLACE DECIMALS ± 1/64
		FRACTIONAL ± 1/2